EXHIBIT L

STANDARD OPERATION PROCEDURES

FOR THE DETECTION AND MANAGEMENT

OF RADIOACTIVE MATERIALS

AT THE

SUNNYVALE MATERIALS RECOVERY AND TRANSFER STATION

OVERVIEW

The State of California is considering two bills that would make radiation monitoring a requirement at State authorized landfills. Although this will not directly affect materials recovery facilities, like the Sunnyvale Materials Recovery and Transfer Station (SMaRT Station), it does mean that trash that is transferred from the SMaRT Station to Kirby Canyon or any other landfill will be monitored for radioactivity. Installation of a radiation monitoring system would allow the SMaRT Station to identify whether any incoming loads contained radioactive materials, make appropriate decisions regarding disposition, present records in case of liability claims, and protect workers. Metals from the SMaRT Station also are recovered and sent on to local metal recyclers with gate radiation detectors. A radiation monitoring system would help the SMaRT Station also avoid sending radioactive metals on to these facilities.

Knowing the amount of radiation in incoming loads of waste will give the SMaRT Station operators confidence that the workers are not being exposed to radiation. Workers may be in the proximity of materials contaminated by persons who received nuclear medical treatment. Fortunately, the radioactivity in these materials is short-lived and relatively harmless.[1] It would be only under unusual circumstances that materials from residences would contain harmful levels of radiation.

Although installation of radiation detection equipment may produce intermittent impacts at the SMaRT Station, it will allow managers to protect workers, identify loads containing radioactive materials, and make informed decisions regarding their disposition.

[1] See the following documents for US NRC Release Procedures for Patients that have received nuclear medicine treatment: US Nuclear Regulatory Guide 8.39, "Release of Patients Administered Radioactive Materials," and Appendix U in NRC's NUREG-1556, Volume 9 "Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Medical Use Licenses,"

INTRODUCTION

The SMaRT Station receives refuse from three San Francisco Bay Area cities, Sunnyvale, Mountain View, and Palo Alto. The 110,000 square foot facility processes around 1,100 tons of refuse per day. Around 175 trucks make deliveries to the SMaRT Station each day and 40 trucks take garbage that cannot be recycled to the Kirby Canyon landfill. The facility is operated by GreenTeam/Zanker, who employs 70+ sorters on 3 sort lines to separate paper, glass, and plastic. Concrete, wood, and scrap metal are sorted by hand on the tipping floor. The SMaRT Station also prepares materials for market and yard waste for composting. All types of industrial vehicles participate in this process: 18-wheel transfer trucks, rear, front, and side-loading refuse, yard waste and recycling trucks, and roll-off trucks. The public also brings waste to the facility's drop-off center in all types of vehicles. In addition, the SMaRT Station receives treated medical waste from the Stanford University Medical Center for transfer to Kirby Canyon landfill.

Over the years, odd things have passed through the SMaRT Station, including goat heads and fake grenades. To date, the SMaRT Station is aware of only one incident in which radioactive materials have entered the facility. A load of scrap metal sent from the SMaRT Station to SimsMetals, a local metal recycler, was returned after Sims gate monitors detected radioactivity in the load. The source was an aircraft dial that was received at the SMaRT Station from an unidentified source. Other types of radioactive materials may have passed through the SMaRT Station undetected by either the SMaRT Station or Kirby Canyon landfill neither of which has monitored waste for radiation until now. As of this writing, the Kirby Canyon landfill does not monitor incoming loads for radioactivity.

Radiation Monitoring Equipment

The SMaRT Station monitors radioactive materials at the incoming scales using two sets of fixed plastic scintillation detectors manufactured by Ludlum Measurements, Inc. Each pair of detectors is connected to a microprocessor that provides continuous monitoring of background radiation and automatic adjustment of alarm setting to compensate for background fluctuations. The system includes a microprocessor with an analog meter, indicator lights for power, alarms, checking, and overspeed, and control buttons. The system is equipped with a date/time printer, red alarm strobe, cables, and a check source. A portable survey meter will be used to identify the general location of radioactive materials in incoming loads. A hand-held radioisotope analyzer will then be used to identify the isotope in order to assist in making a decision as to handling and ultimate disposition of the material.

Recordkeeping

The SMaRT Station maintains a daily operation log for the radiation monitoring system. The log will record the daily check of the system, daily readings of the background radiation levels, and records of any detection at or above Action Level One. The SMaRT Station will maintain records of each incident on a Vehicle Survey Form. Information regarding an incident will be recorded in the daily log book and on the Vehicle Survey Form. Completed Vehicle Survey Forms will be stored in the SMaRT STATION SAFETY FILES. See Appendix E for Vehicle Survey Instructions and a model of the Vehicle Survey Form. Training records for SMaRT Station staff that carry out this SOP will be stored in the SMaRT STATION SAFETY FILES.

Training

SMaRT Station personnel who carry out the SOP will be provided with a copy of the SOP and training specific to their responsibilities.

SOP Revision

This SOP should be reviewed and revised periodically. At a minimum, revisions should be made when any of the following occurs:

- New policies or regulations governing the monitoring or disposal of radioactive material are implemented by the State or Federal government.
- The SOP is ineffective during an incident.
- The facility operation changes causing interference with the current plan.
- New monitoring equipment is installed.
- Contacts change in the State Radiological Health Branch, City staff and contractor staff at the SMaRT Station, and City Hazardous Materials Coordinator.

STANDARD OPERATING PROCEDURE

Scalehouse operators must be familiar with the operation of the radiation monitoring equipment (See Appendix A), daily source checks and log procedures (Appendix B), calibration (Appendix C), and the following information and procedures.

Detection of Radiation and Response

Radiation levels above background have been detected when the microprocessor in the scalehouse is emitting an audible tone and its red alarm indicator light is blinking (see Figure 1).

Figure 1: Detector and microprocessor.

Logging Alarms

All excursions over Action Level One should be logged. Use the date/time printer in the scalehouse to log the radiation level (see Figure 2). Describe the incident in the Daily Log.

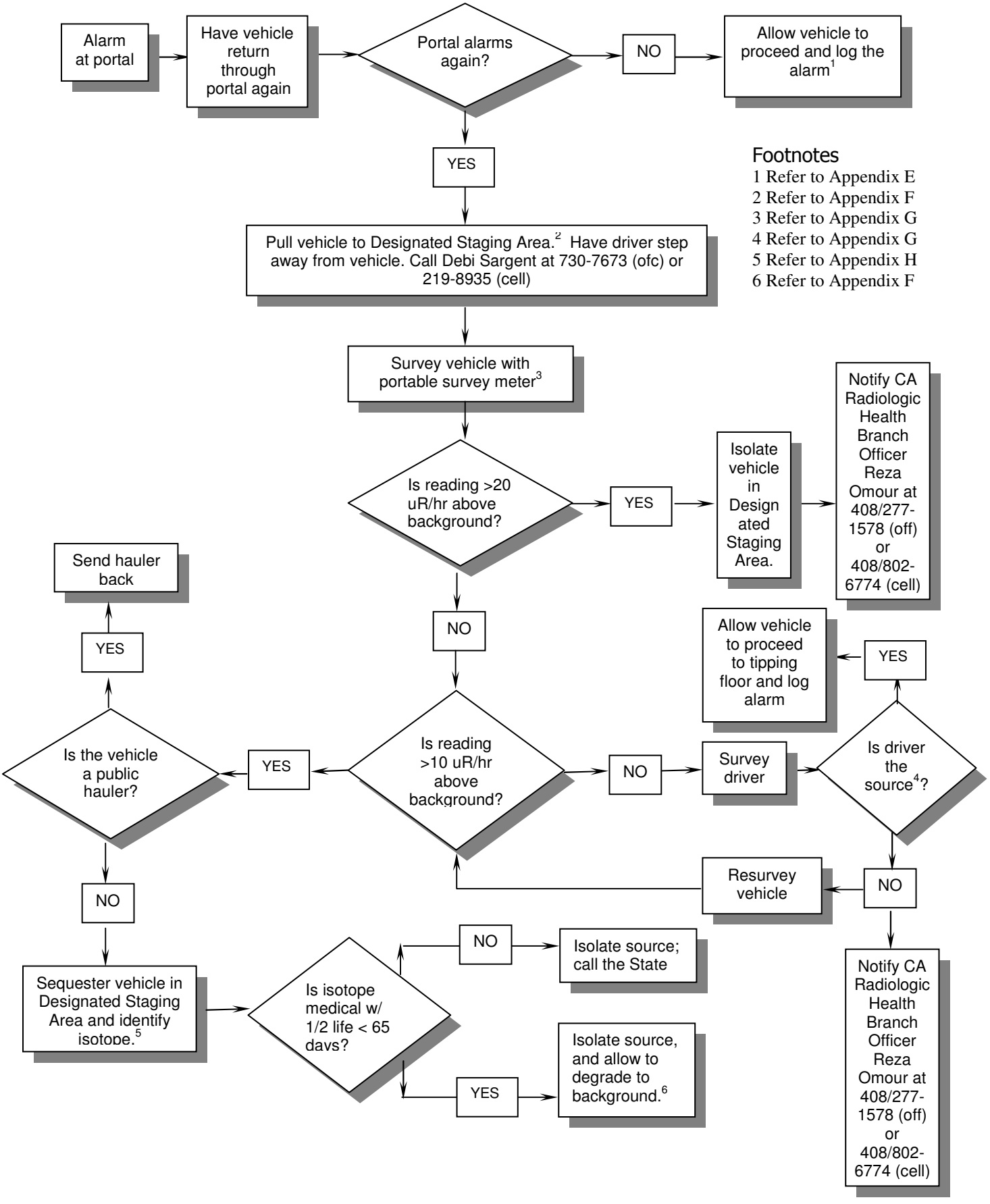
Action Levels

An Action Level is an amount of radiation indicating the need to take specific actions. Because background radiation fluctuates, action levels are set relative to the background. Action Level One is set at 10uR/hr above background, and Action Level Two is set at 20uR/hr above background. [2].

The SMaRT Station uses two actions levels, each requiring different response actions. The system will alarm at Action Level One. When the alarm is triggered, the amount of radiation is at least 10 uR/hr above the background level. Average background levels will be mounted on the system display in the scalehouse. (Background at the SMaRT Station was found to be between 10uR/hr and 12uR/hr based on the procedures and data in Appendix C.)

[2] The Ludlum Model 3500 Series microprocessors continuously monitor background radiation and automatically adjust a user-determined alarm setting (in our case 10uR/hr above background) to compensate for the changes in the background. The system also accounts for the shielding affect as a vehicle passes in front of the detectors. The system first establishes the new background level, compares each individual reading against the non-vehicle background, then against the vehicle background. If any readings exceed the adjusted alarm set-point, they are then further analyzed to determine if there is a potential source in the load.

Scalehouse Alarm Protocol



Footnotes

1 Refer to Appendix E
2 Refer to Appendix F
3 Refer to Appendix G
4 Refer to Appendix G
5 Refer to Appendix H
6 Refer to Appendix F

Action Level One

Action level one occurs when a radiation monitor (with an alarm set point of 10uR/hr above background) alarms indicating the potential presence of RAM in the waste load.

Action Level One Response

Take the following actions for a vehicle that has triggered the alarm:

1. Direct the vehicle to slowly pass by the detectors a second time.
2. If the radiation monitor does not alarm on the second pass, allow the vehicle to proceed and log the alarm.
3. If the radiation monitor alarms on the second pass, take the following actions:
   - move the vehicle to the Designated Staging Area (See Appendix E)
   - have the driver stand 50 feet away from the vehicle
   - Call Debi Sargent at 730-7673 (office) or 408/219-8935 (cellular). If you cannot reach Debi Sargent, call Rich Gurney at 730-7277.
4. Survey the vehicle body and cab as described in Appendix G.
5. If the vehicle survey produces readings greater than 20uR/hr, sequester the vehicle in the Designated Staging Area.
   - Proceed with Action Level Two response
   - Call the State Radiological Health Branch Officer in San Jose, Reza Omour, at 408/277-1578 (office) or 408/802-6774 (cellular).
6. If the vehicle survey produces readings less than 10uR/hr, survey the driver at a distance of 50 feet from the vehicle.
   - If the driver is the source of the radiation, check to see if he/she had a recent treatment with nuclear medicine.
   - If so, allow the truck to proceed.
   - If the driver is not the source of radiation, re-survey the truck. If the truck radiation levels are now at or below background, the truck may proceed as normal.
7. If the vehicle survey produces readings less than 20uR/hr but greater than 10uR/hr, do one of the following:
   - For public haulers, send the vehicle back its point of origin to determine the source of the radiation.
   - For all other vehicles, allow the vehicle to remain in the Designated Staging Area and identify the isotope present following the procedures in Appendix G.

Sequester of a Medical Isotope-Contaminated load

To be sequestered at the SMaRT Station (qualify for disposal), the identified radioisotope must meet the following conditions:

- Produce a detected dose rate less than Action Level Two
- Exist as a medical isotope in the MCA spectrometer library with a half-life less than 65 days (see Appendix J: Radioisotope Libraries and Classification).

[In PA no modeling is necessary to support the disposal of medically contaminated waste at landfills. The vast majority of nuclear medicine and radiotherapy patients are administered radionuclide in the less than 65 day decay category and their excreta is disposed in the sanitary sewer system as permitted by State and Federal law. The small amount of patient-contaminated medical waste will be well under these levels and at landfill facilities should cause no problems or concern.]

Rejection of the Waste load

If the SMaRT Station rejects the load, the following steps are taken:

Survey the entire vehicle to determine radiation field about the truck (see Appendix F for survey forms)

Contact the appropriate CADHS official and notify them of your intentions to reject a load.

[In PA they fax a truck survey form to the State and request that they fax back to the Station, a signed DOT Exemption Form for the vehicle so the vehicle can transport the material to an appropriate facility.

In PA, if the driver leaves the vehicle without a DOT exemption form and before RAM can be evaluated, contact the PA State Police and provide them with any information you may have on the vehicle such as make, model, color, company name, license plate number, time left and the direction in which the vehicle was traveling and, if possible, the intended destination. This is to ensure that the driver does not dispose of the contaminated waste improperly. Notify the appropriate DEP Area Health Physicist listed in Appendix I and alert that individual of the situation.]

Appendix A - RADIATION MONITORING EQUIPMENT

Appendix B - CALIBRATION LOG

Appendix C - DAILY ACTIVITIES

SOURCE CHECKS AND DAILY LOG

Appendix D - DETEMINATION OF UNSHIELDED BACKGROUND RADIATION

Appendix E - LOGGING ALARMS

Appendix F - DESIGNATED STAGING AREA

Appendix G - VEHICLE SURVEY PROCEDURE

Appendix H - RADIOISOTOPE IDENTIFICATION PROCEDURE

Appendix I - VISUAL CUES: RADIOACTIVE ITEMS & SYMBOLS

Appendix J - CONTACTS

Appendix K - RADIOISOTOPE LIBRARIES AND CLASSIFICATION

Appendix E - LOGGING ALARMS

Alarm Log

Name:	Date:
Facility:	Time:

Vehicle Data	Driver Data
Registration:	Name:
Make/Model:	License (# and St)
Year:	Employer:
Color:	Insurance:
No. of doors:	

DESCRIPTION OF OCCURRENCE

Attach readout from gate monitor.

Distinguishing Marks on Vehicle (Commercial name, graffiti, damage, load cover, cap or enclosure for truck bed, etc.)

Appendix F - DESIGNATED STAGING AREA

- Remove driver and all other personnel at least 50 feet from the vehicle.
- Use the GMSM to establish an exclusion boundary based on a detected dose rate of 2mrem/hr. Place a rope and signs at this boundary.
- Physically secure the load or maintain it under surveillance while it remains at the facility.
- Contact the individual responsible for supervising response to alarms at the facility.
- Contact the appropriate Local or State Health Physicist for approvals.
- If isolating medical waste with isotopes of less than or equal to 65 days . . .

Appendix G - VEHICLE SURVEY PROCEDURE

Portable Survey Meter Use and Procedures

Survey the Truck

1. Move driver at least 50 feet away from vehicle during survey.
2. Turn meter ON.
3. Check BATTERY condition. If battery is not charged, replace battery before proceeding.
4. Set scale for x100
5. Turn on Audible speaker.
6. Check probe function:
- Hold probe against CHECK SOURCE on side of meter
- Reading should match that on the calibration label.
7. Establish BACKGROUND radiation level
    - Hold probe away from meter
    - Note background radiation level
    - Record background reading on Survey Form.
8. Scan the vehicle:
    - Hold meter within 5 cm (2 inches) of surface.
    - Move the meter slowly on each side, front, rear, and inside cab of truck.
9. If any readings are more than 10uR/hr over the background level, the vehicle should be considered a possible radiation source.
    - Mark hot spots with chalk.
    - If the counts vary wildly at a certain spot, hover over that spot until the counts stabilize and determine whether the reading is above background.
    - Record readings on Vehicle Survey Form.
10. Compare survey readings to the Action Levels (see Scalehouse Alarm Protocol Flowchart).

Survey the Driver

11. Scan the driver and any passenger:
    - Hold meter within 5 cm (2 inches) of surface.
    - Move the meter slowly by driver's clothing, hands, shoes, face, and hair.
12. If the driver or passenger shows readings more than 10uR/hr over the background level, ask whether either has undergone recent nuclear medical treatment.
    - If either has, allow the driver and vehicle to proceed.
    - If none has, notify the local CA Radiologic Health Branch Officer Reza Omour at 408/277-1578 (office) or 408/802-6774 (cellular).
13. Record readings on Vehicle Survey Form.

Vehicle Survey Form

Surveyor Name:	Date:
Facility:	Time:

Vehicle Diagram (front, rear, side, as applicable)
(Sketch in vehicle diagram and mark the locations measured and the readings.)

Survey Instrument
Meter Used:
Meter Settings:
Background Readings:

DESCRIPTION OF OCCURRENCE

Waste was (Circle one): Rejected Processed Disposed

Vehicle Transporter/Supplier/Handler
Name:
Address:
Phone:
Vehicle ID and License Number:

Appendix I - VISUAL CUES: RADIOACTIVE ITEMS & SYMBOLS

Fiestaware and Vaseline Glass

Uranium compounds have been used for centuries to color glass. A 2,000 year old sample of yellow glass found near Naples, Italy contains uranium oxide. Uranium trioxide (UO_3) is an orange powder and has been used in the manufacture of Fiestaware plates. Other uranium compounds have also been used to make Vaseline glass and glazes. The uranium within these items is radioactive and should be treated with care.
http://education.jlab.org/itselemental/ele092.html

Figure 1: Fiestaware[3]

Figure 1: Vaseline Glass[4]

[3] Source: http://www.dangerouslaboratories.org/rglass.html
[4] Source: http://www.dangerouslaboratories.org/rglass.html

Ionization Smoke Alarms

Two types of smoke detectors are ionization and photoelectric detectors. Ionization smoke detectors use an ionization chamber and a source of ionizing radiation to detect smoke. This type of smoke detector is more common because it is inexpensive and better at detecting the smaller amounts of smoke produced by flaming fires. Inside ionization detector is a small amount (perhaps 1/5000th of a gram) of americium-241. The radioactive element americium has a half-life of 432 years, and is a good source of alpha particles and gamma rays or photons.

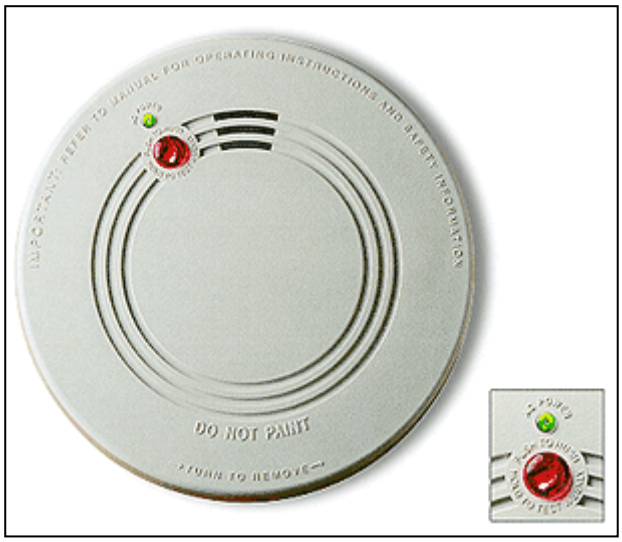


Figure 3: Ionization Smoke Detector[5]

Another way to talk about the amount of americium in the detector is to say that a typical detector contains 0.9 micro curie of americium-241. A curie is a unit of measure for nuclear material. If you are holding a curie of something in your hand, you are
holding an amount of material that undergoes 37,000,000,000 nuclear transformations per second. Generally, that means that 37 billion atoms in the sample are decaying and emitting a particle of nuclear radiation (such as an alpha particle) per second. One gram of the element radium generates approximately 1 curie of activity (Marie Curie, the woman after whom the curie is named, did much of her research using radium).[6]

[5] Source: http://info.load-otea.hrdc-drhc.gc.ca/fire_prevention/bulletins/smoke.shtml
[6] Source: http://home.howstuffworks.com/smoke2.htm

Luminous Dials on Aircraft Gauges and Household Appliances

Many older flight instruments have radium activated luminous markings. Although the external radiation hazard due to normal handling of these instruments is negligible, repair of them presents a potential health problem. The self luminous material, generally found on dial faces and pointers and adjacent to or on switches, tends to flake with age. When an instrument is damaged or dismantled, particles of the radium paint can be ingested, inhaled, or absorbed through a break in the skin. Ingestion can occur following accumulation of radioactive material on the hands, cigarettes, and food. Benefits derived from use of radium activated luminous dials rarely warrant the health hazards involved in reconditioning the dial faces. Though many of the dials have long since lost their light emitting property, the radium is still present.[7]

Figure 4: Luminous Dials on Aircraft and Household Equipment[8]

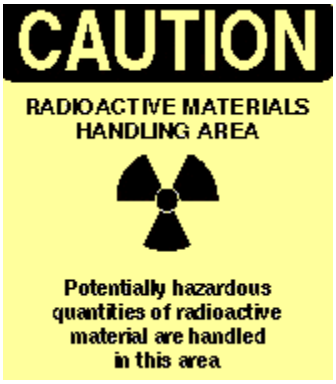
Density Gauges

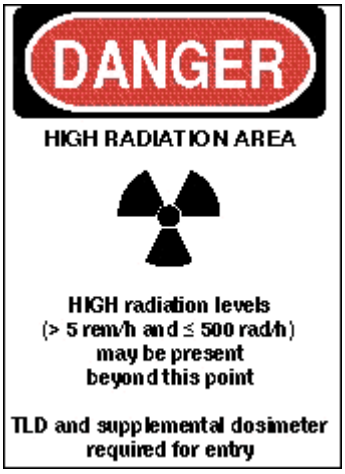
[7] http://www2.faa.gov/avr/aam/3910-3a.htm

[8] Sources: www.aviation-antiques.com/instruments-4.html and www.radioattic.com/attics/hartman.htm

Radiation Signs

This symbol is called a tri-foil and it is the international symbol for radiation. The symbol can be magenta or black, on a yellow background. This sign is posted where radioactive materials are handled, or where radiation-producing equipment is used. This sign is used as a warning to protect people from being exposed to radioactivity. Be alert for this symbol in a load that has triggered the radiation detection alarm.





http://www.epa.gov/radiation/students/symbols.html

The following list is from IEM's website

Fertilizers
Vermiculite
Gas Lantern Mantles
Thickness Gauges
Voltage Gauges and Current Surge Protectors
Spark Plug Gap Irradiators
Fluorescent lamps
Electric Blanket Thermostats
Exit Signs
Military Applications
Cardiac pacemakers
Static eliminators
Tobacco products

Salt Substitutes
Lightning Rods
Mettler Balances
Radioluminescent gauges for aircraft
Clock dials
Pull chains on light bulbs
Switches
Chamber pot lids
Doorknobs
Religious statuary
Telephone dials
Fishing lures
Markers at military bases to assist movement during blackout periods
Optical lenses
High quality lenses (night sights for military applications)
35 mm camera lenses
Welding rods
Rocket nozzles
Lighting filaments
Black ceramic spot plates to visualize light-colored precipitates and porcelain dentures
Cloisonné jewelry (orange coloring)
Kaolin (used in many magazines to produce a high gloss appearance)
Kaopectate (anti-diarrhea medication)
Cat litter

Appendix J - CONTACTS

The City of Sunnyvale person responsible for the implementation of the Action Plan is **Debi Sargent**, the Contract Administrator for the SMaRT Station operator.

- Office 408/730-7673
- Cellular 408/219-8935

The City of Sunnyvale backup person in case Debi Sargent is not available is **Rich Gurney**, the Recycling Supervisor for the City of Sunnyvale.

- Office 408/730-7277
- Pager 408/231-9457

The GreenTeam/Zanker person responsible for the implementation of the Action Plan is **Todd Storti**, the General Manager of GreenTeam/Zanker, operator of the SMaRT Station operations.

- Office 408/752-2795
- Cellular 408/594-2798

The GreenTeam/Zanker Environmental, Health, and Safety Manager is **Maira Simone**.

- Office 408/752-8530
- Cellular 408/590-4760

The City of Sunnyvale Hazardous Materials Coordinator is **Ron Staricha**.

- Office 408/730-7219

The State contact for the radiation monitoring at the SMaRT Station is **Reza Omour**, the San Jose Office Chief of the Department of Health Services Radiologic Health Branch:

- Office 408/277-1578
- Cellular 408/802-6774